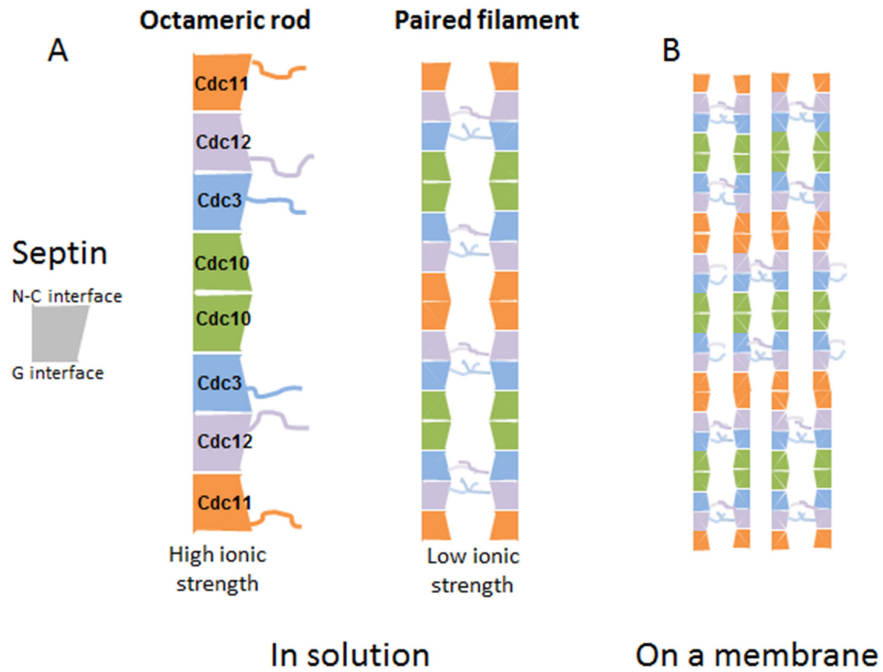


Supplementary information

**Membrane reshaping by micrometric  
curvature sensitive septin filaments**

**Beber et al.**

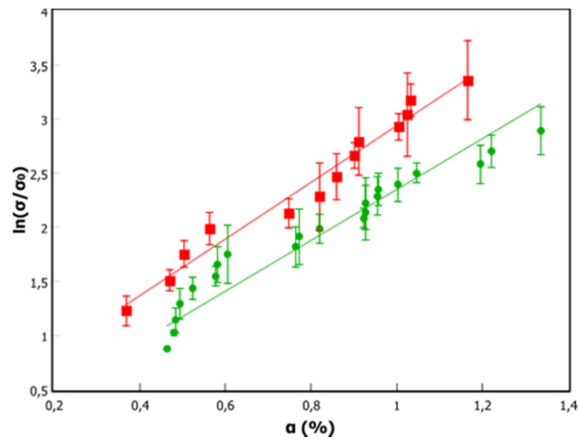
**Supplementary figure 1.**



A. Schematic representation of an octameric Septin rod in solution. Septins are arranged in a palindromic fashion and self-assemble into non polar paired filaments (right).

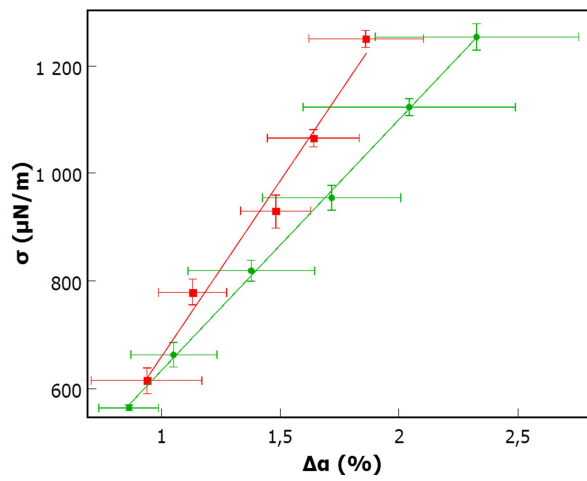
B. Arrangement of Septin filaments bound to a membrane. To maintain a regular spacing in between filaments, imposed by coiled coils, the octamers might be oriented differently within the same filament.

**Supplementary figure 2.**



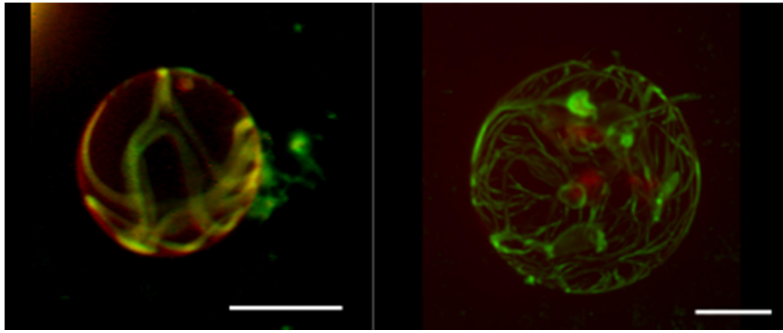
Measurement of the mechanical properties of a single GUV at low ( $\sigma < 0.5 \text{ mN.m}^{-1}$ ) tension regime without (red) and with (green) septins. The graph shows the logarithm of the applied tension versus the relative increase in area. The slope allows us to extract a value of bending modulus of  $9.4 \pm 0.5 \text{ K}_b\text{T}$  (left) and  $9.7 \pm 0.5 \text{ K}_b\text{T}$  (right). Error bars are s.d.

**Supplementary figure 3.**



Applied tension versus area expansion at high tension ( $>0.5$  mN/m). The red curve corresponds to the control and the green curve to the septin-coated experiments. The values extracted from the slopes are  $K_{\text{control}} = 65 \pm 9$  mN/m and  $K_{\text{septins}} = 42 \pm 8$  mN/m. Error bars are s.d.

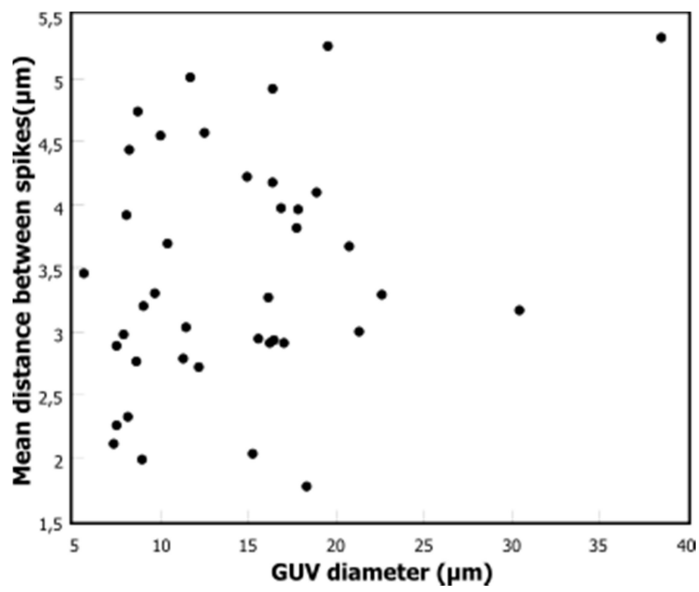
**Supplementary figure 4.**



Top: 3D reconstruction of confocal images of GUVs in a solution of 200 nM septins. Lipids are in red and septins in green. Septins can form a network of bundles on the vesicle.

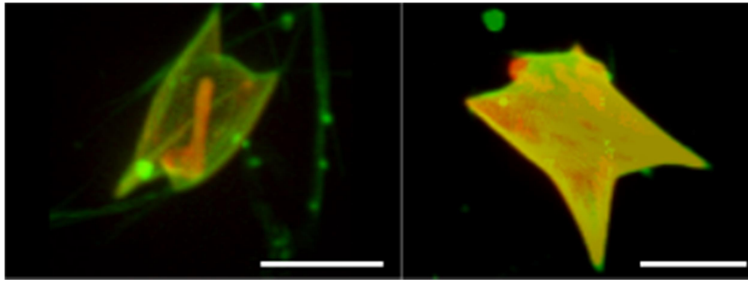
Scale bars = 10 $\mu$ m.

**Supplementary figure 5**



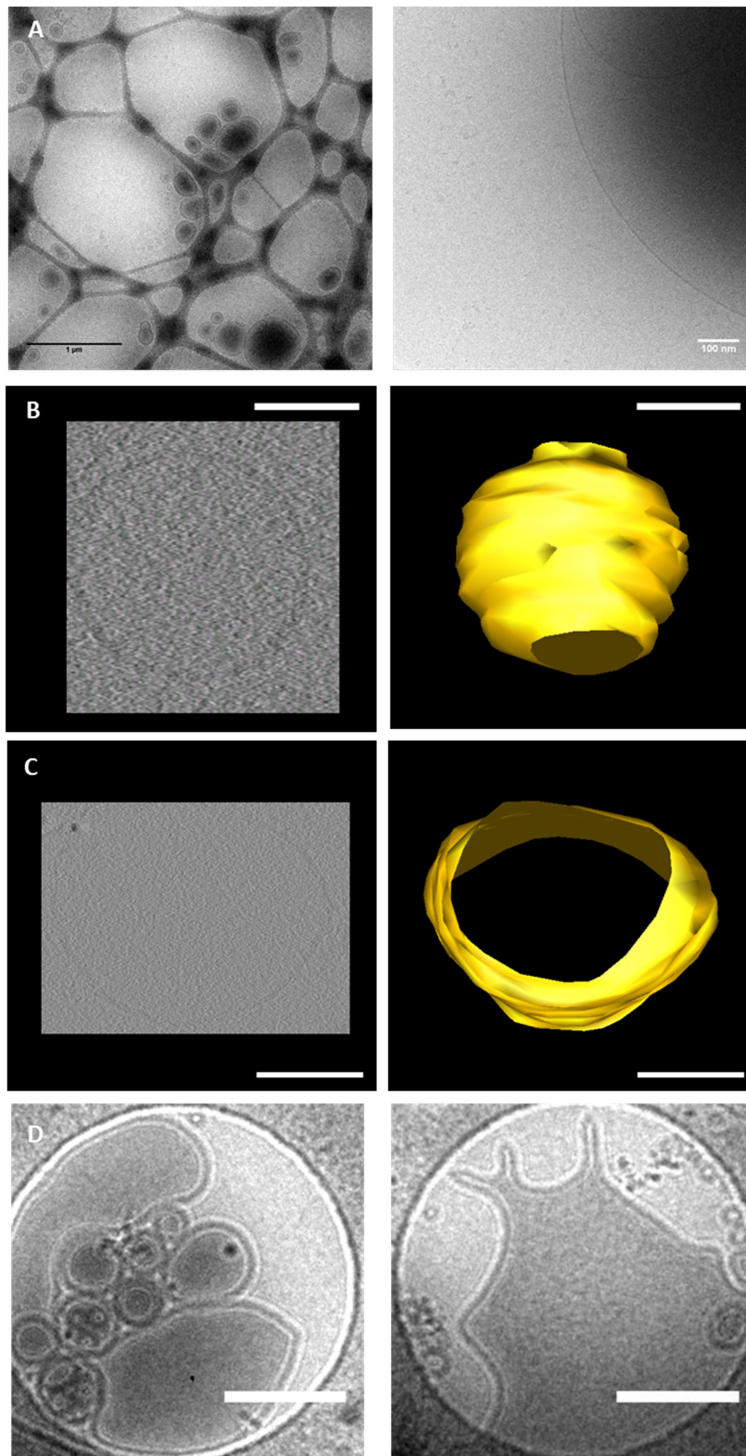
Mean distance between spikes measured for individual GUVs as a function of the GUV diameter. The distance appears to be independent of the GUV diameter.

**Supplementary figure 6**



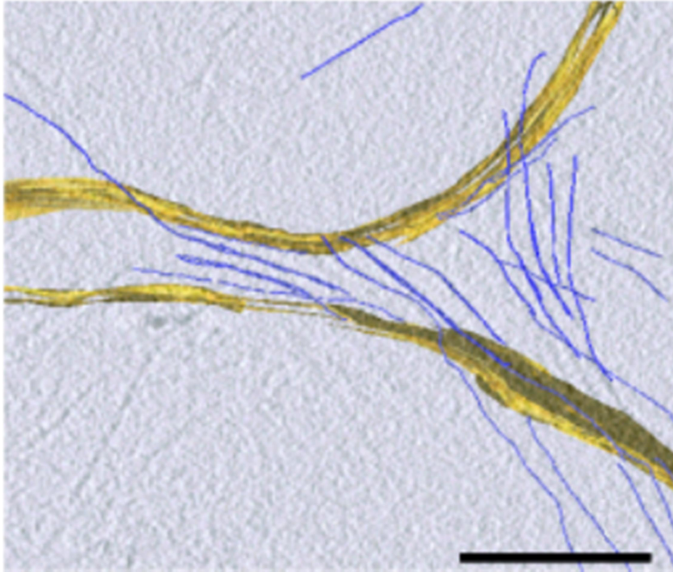
3D reconstruction of confocal images of GUVs in a solution of 200nM after 24h of incubation. Large deformations (spikes) are visible. Scale bars are 1 $\mu$ m.

**Supplementary figure 7**



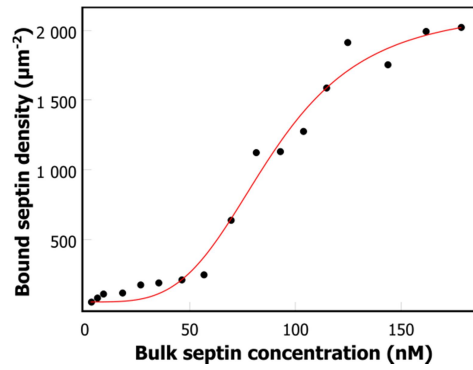
A. Control image of naked LUVs at low magnification (left, scale bar: 1 μm) and higher magnification (right, scale bar: 100 nm). B and C. slices in tomograms carried out on control samples (left). The membrane segmentation is shown in yellow (right). C: scale bar 50 nm, D: scale bar 100 nm. D. Enlarged inserts from figure 3.A, right panel. Scale bar: 500 nm.

**Supplementary figure 8**



Example of a slice within a tomogram where filaments arrange in the vicinity of a protrusion. Scale bar: 200 nm.

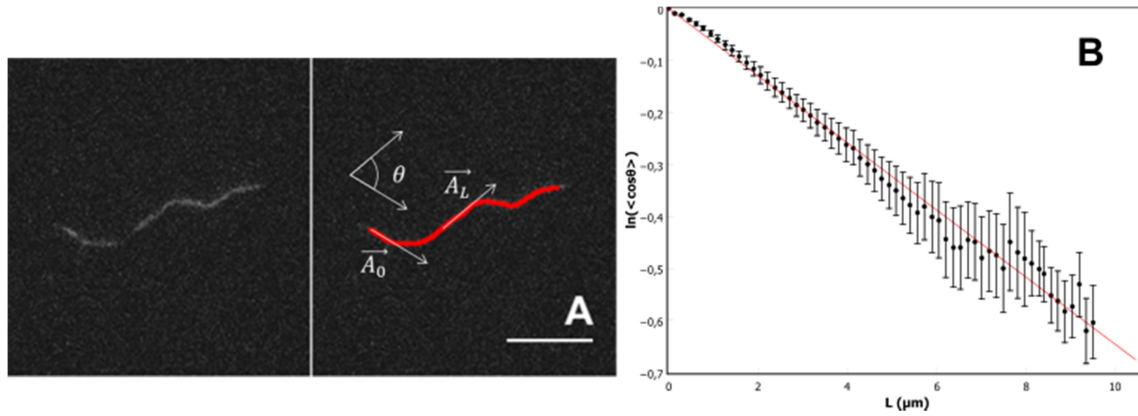
### Supplementary figure 9



Bound septin density on a flat supported lipid bilayer as a function of bulk septin concentration (black dots).

The  $K_d$  value ( $88 \pm 6$  nM) was extracted by fitting with a Hill equation (red curve).

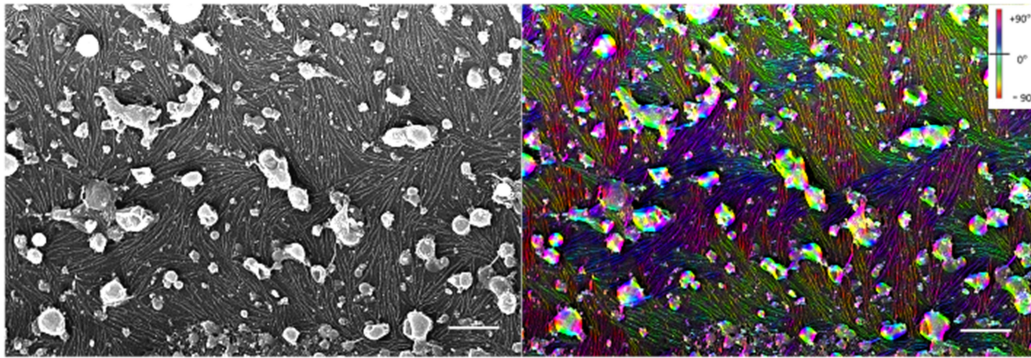
**Supplementary figure 10**



A) TIRF image of a septin filament on a surface passivated with PLL-PEG (left). Image of the same filament tracked by the jFilament plug-in (right). Scale bar 10  $\mu\text{m}$ .

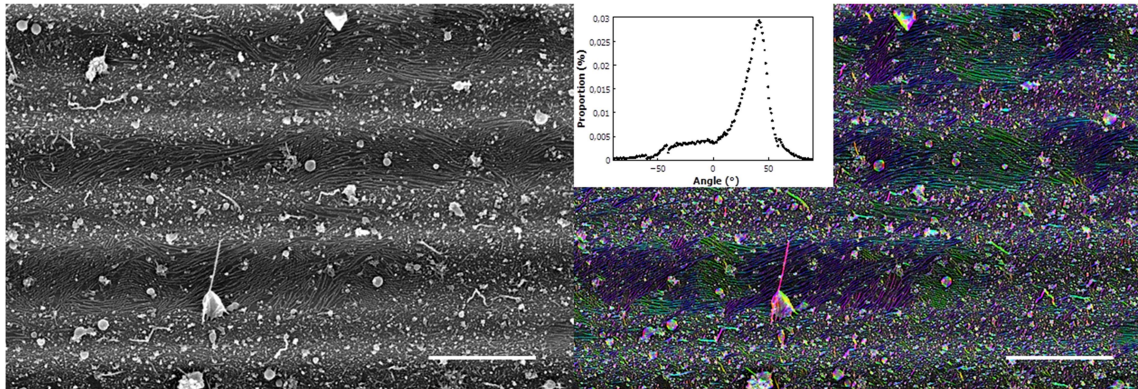
B) Mean angle of unit vectors tangential to the septin filaments as a function of arc length. The slope gives the persistence length of double septin filaments.  $L_p = 7.8 \pm 1.1 \mu\text{m}$ . Error bars are s.d.

**Supplementary figure 11**



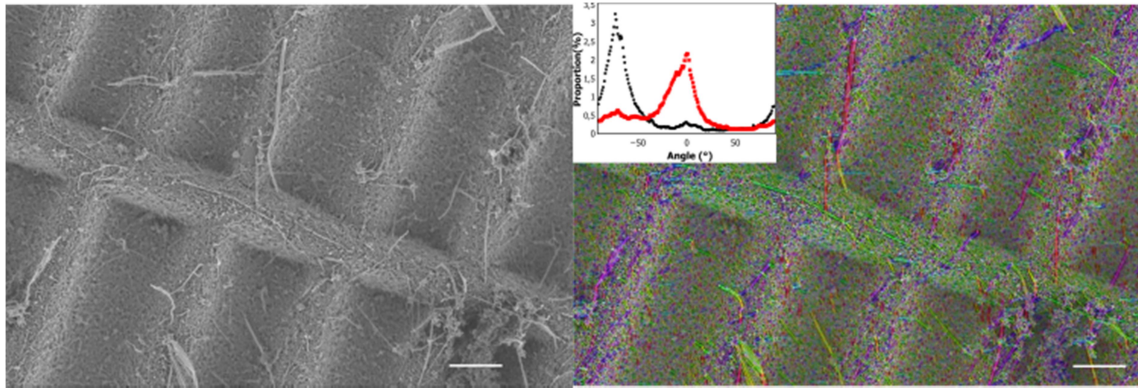
SEM image of septin filaments on a flat supported lipid bilayer (left). Same image colored with the OrientationJ plug-in (right). Scale bar 200 nm. Filaments show no preferential orientation.

**Supplementary figure 12**



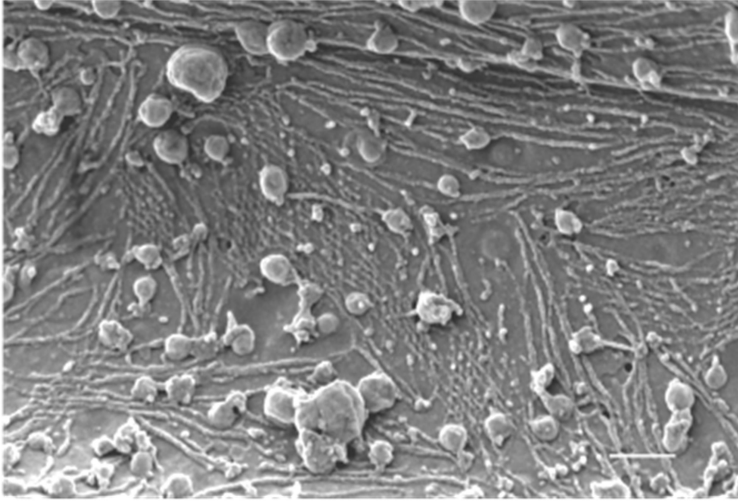
SEM image of septin filaments on a curved supported lipid bilayer,  $C_{max} = 1.6 \mu\text{m}^{-1}$  (left). Same image colorized by the OrientationJ plug-in,  $0^\circ$  orientation corresponds to the axis of null curvature (right). Graph shows the angular distribution of pixels which displays a peak at about  $40^\circ$ . Scale bar  $1\mu\text{m}$ . Filaments show a less organized distribution at this curvature.

**Supplementary figure 13**



SEM image of septin filaments on a patterned substrate after 24h of incubation (left)  $C_{max} = 3\mu\text{m}^{-1}$ . Same image colorized with the OrientationJ plug-in (right). Graph shows the angular distribution of pixels.  $0^\circ$  orientation corresponds to the axis of null curvature for negative (black) and positive (red) curvatures. Scale bar  $1\mu\text{m}$ .

Supplementary figure 14



SEM image of septin filaments on a patterned surface ( $C_{max} = 3\mu\text{m}^{-1}$ ) showing crossed filaments.  
Scale bar 200 nm.